Conducting a Watershed Inventory

FOCUS

- Determining theinformation you need
- Organizing an inventory team
- Collecting the data
- Resources for finding the information you need

Inventory—the collection of natural resource, economic, and social information within the watershed.

After your group has worked through writing vision and mission statements and has established goals for change, it is important to answer the question "**What is our watershed like right now?**" Conducting an inventory consists of gathering and organizing all the relevant information on the watershed in order to answer that question.

A watershed inventory should provide the data for your group to make informed resource management decisions. Information must be gathered in order to understand the watershed's present condition, the potential of the natural resources in the watershed, and the human interaction with those resources. An inventory provides benchmark conditions that can be used later to evaluate the impact of the project. A watershed inventory should be thorough enough to analyze and understand the natural resources and human conditions within the watershed.

Determine what information you need

Ask questions such as

- What facts do we need to know about the watershed if we're going to achieve our vision of the watershed's desired state ?
- How much time and money do we want to spend doing this inventory?
- What data do we need in order to identify natural resource, social, and economic trends?
- How much data do we need in order to feel comfortable explaining the condition of the watershed to others?
- Should data be sampled from a few key points in the watershed, or should there be a total, detailed coverage of the watershed?
- What environmental indicators can we use?

Organize an inventory team

The inventory team should include anyone who has a knowledge of the local resources and a desire to help. Technical specialists from federal and state agencies could serve as team members or advisers. Local landowners within the project area should be encouraged to participate. Team members may be added as the need arises.

The inventory team is responsible for determining the plan for conducting the inventory. Involving the entire team is important, since diverse perspectives will generate good ideas. The inventory team should develop a list of work items that are essential to completing the inventory and the planning process. For each work item, it is important to clearly identify the following:

> Purpose
> Scope
> Procedure
> Desired output
> Costs
> Starting and completion dates
> Responsible parties

The inventory team should work with the local watershed group to review resource concerns and the group's goals in the context of the *desired future condition,* "what we want our watershed to be like." This is important if the inventory team is mostly agency folks who have not been involved in the group's early growth.

The team will want to utilize local knowledge and existing information to further define the concerns. Separate out the concerns that are based on seat-of-the-pants reasoning—"the water is muddy so it must be unhealthy"—to see if investigation will validate the concern.

The team will want to create a written plan of action for doing the watershed inventory. This plan should describe in detail what strategies will be used to identify problems and clarify goals. Each member should know what job they will do, when the job is to be done, and what the final product will be. Refer to Chapter 6 for more information on action planning.

Conduct public input meetings to enlist community support

The group, with the assistance of the inventory team, should conduct at least one public meeting to inform the general public of the planning effort unless public meetings have already been held. At this meeting the group should ask the community to identify problems and resource information that people in the community have in hand. Seek additional people from the meeting attendees to aid in the inventory.

Local citizens have a vital role to play. Volunteers can carry out many of the inventory responsibilities; it is best to have some idea how many are willing to participate, in order to plan an inventory that can be carried out. Once you have an idea of what you are going to inventory, you can begin to decide who you will need to conduct the inventory.

Technical personnel for the team can come from the Natural Resources Conservation Service, the Indiana Department of Natural Resources, Soil & Water Conservation Districts, Cooperative Extension Service, and Indiana Department of Environmental Management and similar agencies.

Collecting the data

1. Collecting reference material is important for conducting your inventory. Helpful references include
    * county soil surveys
    * Section 305(b) reports from and other water-quality assessment reports from agencies
    * diagnostic & feasibility studies or other studies that may have been done earlier
    * fish population studies
    * water-quality reports
    * Agricultural Statistics yearbooks
    * topographic and geological maps
    * county comprehensive plans, et cetera
2. Use established inventory procedures such as those found in many of the NRCS manuals and handbooks:
   National Agronomy Manual
   National Biology Manual
   National Forestry Manual
   Water Quality Indicators Guide: Surface Water, NRCS-TP-61
3. Check with other agencies and groups to determine what inventory procedures are available. Use worksheets or other guides to help keep the inventory process clean and traceable. Sample worksheets are included at the end of this section. Don't forget to designate somebody to compile the worksheets into a report.
4. Establish cause and effect relationships. When local citizens participate in inventories, the cause and effect relationships of problems become much clearer. When you are trying to determine *cause*, use the Why question. When you are trying to determine *effect*, use the So What question.

> **Example:** During the summer of 1996 there was a massive algae bloom in the lake. Ask *Why* to lead you to the cause. (Why did it happen?) Ask *So What* to lead you to the effect. (So what happened then?)

5. Make use of 'resource quality criteria'. Quality criteria set the standards and conditions that you are trying to achieve. These criteria answer the question, "How clean should the water be," or "how many fish should we have." This will help identify resources that are below minimum standards. Resource quality criteria can be found in the Natural Resources Conservation Service (NRCS), *Field Office Technical Guide*, Section III. Other sources of criteria are state water quality standards, rapid bioassessment protocols, and other measures.
6. Different aspects of the watershed will need to be inventoried. Information relating to ground and surface waters, cultural resources, threatened and endangered species, and laws and local regulations is usually included in a watershed inventory. Each watershed partnership will collect resource information specific to their situation, their identified concerns and their desired future condition. As an example, a watershed inventory for a lake might focus on these areas:

- Water quality
- Aquatic vegetation
- Fish populations
- Wildlife habitat
- Flood control
- Recreation
- Aesthetics

7. The EPA's *Index of Watershed Indicators* (http://www.epa.gov/iwi) looks at the following parameters to describe the condition and vulnerability of a large watershed:
   - Designated use attainment reports (IDEM 305(b) report)
   - Fish consumption advisories (State Health Department)
   - Source water quality for drinking water systems (local water utilities)
   - Contaminated sediments
   - Water pollution data
   - Wetland loss
   - Aquatic and wetland species at risk
   - Permit violations for dischargers
   - Urban runoff potential
   - Agricultural runoff potential
   - Population change
   - Hydrologic modification (dams)

It probably isn't possible to find all of those kinds of data for your particular watershed, but this list should provide you with ideas of what to search for. Remember that the overall point of a resource inventory is to provide the decision makers with information so they can make informed resource management decisions.

Watershed inventories should employ the best information available at the time; as new data become available they should be added to the inventory and the watershed plan should be adjusted accordingly. Rarely is a resource inventory an exhaustive study of the natural system. However, if the inventory can clarify resource concerns, help local people understand cause and effect relationships, and set a course to reach a desired future condition, it has achieved its goal.

The information collected by the inventory team should be presented to the watershed group and to the public via meetings or other media. The team should be completely non-judgemental in its presentation. Maps, tables, charts and other visual tools will make the information easier to digest. The team should not try to draw too many conclusions from the information; it is not their job to make decisions for the watershed group. The team should prepare a written report detailing what they did and what they discovered; this report will become a part of the watershed plan.

WATERSHED INVENTORY WORK ASSIGNMENTS

Name of Project _____ Date _____

Work Item _____ Prepared by: (Team Members) _____

_____

_____

A. Kind of information needed:

B. Is the information available?
   ❑ **Yes** (Where is it and who has it?)

   ❑ **No** (Proceed with worksheet.)

C. How much detail do we need?

D. What format do we want the data in? (map, table, narrative, etc.)

E. Potential procedures for collecting information:

	Procedure	How long will it take?	Estimated Cost
1.			
2.			
3.			

F. Schedule:
   Procedure _____

   Time (Days) _____ Estimated Cost _____

   Start Date _____ Finish Date _____

   Anything we need to do first? _____

   _____

   _____

G. Person(s) responsible for collecting this information: _____

   _____

   _____

Finding the information you need

When your group is in the initial information-gathering stage, tracking down sources can be very frustrating. The following is a list of resources, the agencies that have data about those resources, and the type of data that may be available *(Note: This list is not all-inclusive).*

Be aware that in some cases the information will be in the form of "raw data." In this case you will need to ask for assistance from the agency that collected the data, or a technical assistance agency, for analysis and interpretation.

Phone numbers for most of the agencies listed are in APPENDIX B: CONTACTS

Resource	Agency	Type of Information
Soil	Natural Resources Conservation Service (contact the local county SWCD office)	Soil Surveys, published for each county, contain soil maps and detailed descriptions about the soil's physical characteristics, uses, and hazards. By 2002, many soil surveys will be available on CD-ROM. These can also supply erosion rates, tillage practices.
Land Use and Cover	SWCD County offices	Topographic maps, aerial photographs, and aerial slides may be viewed at the office; photographs may be purchased through the Farm Service Agency.
	NRCS: the National Resource Inventory (Contact the state NRCS office)	Land use, cover, crop, and other landscape characteristics have been recorded every five years since 1977. Reports detailing land use trends are published.
	GAP Analysis. Carried out by the U.S. Fish & Wildlife Service in Indiana; contact their state office	Satellite data is used to provide maps of land use, vegetative cover, etc. There will be a charge for some maps.
	Local Planning Departments	Numbers of building and subdivision permits; county master plans; transportation plans; county demographics.
	Agricultural Statistics	Crop, livestock and farm statistics. Contact Purdue Cooperative Extension offices.

Resource	Agency	Type of Information
Aquatic Life (including fish)	IDNR Fish Population Studies	Contact the Division of Fish & Wildlife for specific studies.
	IDEM Fish Population, Fish Tissue, and Macroinvertebrate Studies	Contact the Assessment Branch at IDEM for specific studies and reports.
	Indiana State Department of Health	Annually published Fish Consumption Advisories.
Water	IDEM Water Quality Monitoring: contact the Assessment Branch for data on specific streams and lakes	Extensive water chemistry data, some showing trends over many years and some more recent, also for groundwater. Ask for assistance with interpreting the data.
	Volunteer monitoring groups; data in *Riverbank* web site	Contact local groups. See the Riverwatch and Riverbank internet sites. (Appendix A)
	U.S. Geological Survey	Water chemistry data on certain watersheds and for groundwater. Contact the USGS state office. USGS also delineates watersheds for the Hydrological Unit Code maps and publishes topographic maps.
	IDNR Diagnostic and Feasibility studies done through Lake & River Enhancement	Contact L&RE for specific reports on certain waterbodies.
	Army Corps of Engineers	If the reservoir is managed by ACOE, there will be water quality data taken each year; contact the manager of the dam for the specific lake.
	Local Water Utilities	Contact your drinking water suppliers for data on both upstream (pre-treatment) and post-treatment water.

Resource	Agency	Type of Information
Water (cont'd)	Streams/watersheds	USGS topographic maps, USGS watershed maps, IDNR Divisions of Water stream maps
	Drainage: local drainage boards. Also stormwater management systems.	Condition & location of regulated drains; cost of cleaning & maintaining drainage systems.
	Impaired waters	IDEM 305(b) report, can be found in public libraries; or the annual 303(d) list of impaired water bodies prepared for EPA, found on the IDEM website.
	Drinking water sources	IDEM Drinking water branch, or EPA's *Surf Your Watershed* website.
	Water budgets (quantity)	IDNR Division of Water
	Wetlands	NRCS inventory maps, USF&WS inventory maps
	Protected & designated waters	IDNR Division of Water list of exceptional use waters
	Point source outfalls (permitted facilities with something that comes out of a pipe)	IDEM Permits Branch, or EPA's EnviroFacts website.
Geology	Indiana Geological Survey	Call their Bloomington office for reports and maps of geologic features and hazards.
	USGS	Call the state office or visit their website for map information.
Air Quality	IDEM Air Branch	Contact for information
Endangered and Threatened Species	IDNR Division of Nature Preserves maintains the Heritage Database of E&T species locations, with the Nature Conservancy	Information on E&T and on the normal range of vegetation and wildlife. Contact the Division office.

Resource	Agency	Type of Information
Vegetation & Forestry	NRCS (Agronomy)	Seeding specifications, plant suitability; local offices.
	Cooperative Extension	Planting specifications, plant suitability; local office.
	IDNR Division of Forestry	Technical assistance with establishing and managing woodlands. Contact the District Forester in your area.
Livestock	Ag statistics & ag census data	Numbers of livestock. Contact Purdue co-op extension
	Animal Waste	NRCS: study on animal waste production by county; infomation on animal waste management.
Wildlife	IDNR Division of Fish & Wildlife	Technical assistance. Contact District Wildlife Biologists.
	U.S. Fish & Wildlife Service	Technical assistance. Contact the state office.
Human Population Statistics	Census Data	Population density, trends, etc. Contact the Indiana Department of Commerce or use the census internet information or your local library.
	Chambers of Commerce	Economic trends, employment trends. Contact local Chamber.
Pesticide & Fertilizer Use	Indiana Office of the State Chemist	Tracks purchases for the state by year.
Waste Disposal	Local health department	Septic & sewer information, local landfill information.
	IDEM Office of Solid & Hazardous Waste	Permit information, information on the functioning and lifespan of existing landfills, information on toxic materials.